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### Progress in Chronic Disease Prevention

#### **State Laws Restricting Minors' Access to Tobacco**

To reach the goal of a smoke-free society by the year 2000, children and adolescents must be prevented from initiating the use of tobacco. However, recent national surveys on adult tobacco use indicate that 90% of all new smokers now begin smoking before age 21 (1). Laws restricting access to tobacco by minors may help delay and ultimately prevent the decision to begin tobacco use during adolescence (2). This report summarizes the content and coverage of state laws restricting minors' access to tobacco.

State laws restricting the sale and distribution of tobacco to minors were described in the 1989 Report of the Surgeon General, *Reducing the Health Consequences of Smoking: 25 Years of Progress* (1). That review covered laws in existence as of October 1988. Additional data about these laws and about licensure requirements for the sale of tobacco were obtained in a survey of health agencies in all 50 states and the District of Columbia administered in October 1989 by the Association of State and Territorial Health Officials (ASTHO) (3).

Forty-four states and the District of Columbia have laws restricting minors' access to tobacco (Table 1). The age for legal purchase of tobacco products is 19 years in three states, 18 years in 36 states, 17 years in four states, and 16 years in one state and the District of Columbia. Of these, 42 states and the District of Columbia also prohibit the free distribution of tobacco products to minors. Seventeen states require signs posted at the point of sale that warn about the age limit for purchase of tobacco. Laws in 44 states and the District of Columbia specify penalties for selling tobacco to underaged persons; these penalties include jail sentences (up to a 1-year imprisonment in Minnesota) and/or fines (ranging from \$2 in the District of Columbia to \$3000 in Minnesota).

Whereas all states license the production or distribution of tobacco, 23 states and the District of Columbia require state licenses for retail vendors of tobacco (South Dakota requires a license for vending machines only, and three states [Minnesota, Nebraska, and Wisconsin] require that local jurisdictions act as the licensing agents). Of these, four states (Massachusetts, New Hampshire, New Jersey, and Rhode Island) have laws requiring administrative revocation of the license for specified violations of minors' access laws (other states have provisions for revoking licenses as part of

TABLE 1. Summary of current state laws restricting minors' access

State*	Minimum age (yrs) for sale or possession	Prohibits sale of tobacco products to minors	Prohibits free distribution of tobacco to minors	Requires sign posted point of sale
Alabama	19	Yes	Yes	No
Alaska	19 <sup>§</sup>	Yes	Yes	No
Arizona	18 <sup>§</sup>	Yes	Yes	No
Arkansas	18	Yes	Yes	No
California	18 <sup>§</sup>	Yes	Yes	Yes
Colorado	18	Yes	Yes	No
Connecticut	18	Yes	Yes	No
Delaware	17	Yes	Yes	No
District of Columbia	16	Yes	Yes	No
Florida	18	Yes	Yes	Yes
Georgia	17	Yes	Yes	No
Hawaii	18	Yes	Yes	No
Idaho	18 <sup>§</sup>	Yes	Yes	No
Illinois	18 <sup>§</sup>	Yes	Yes	Yes
Indiana	18 <sup>§</sup>	Yes	Yes	Yes
Iowa	18	Yes	Yes	No
Kansas	18 <sup>§**</sup>	Yes**	Yes	No
Kentucky	No	No	No	No
Louisiana	No	No	Yes	No
Maine	18 <sup>§</sup>	Yes	Yes	Yes
Maryland	18	Yes	Yes	No
Massachusetts	18	Yes	Yes	Yes
Michigan	18 <sup>§</sup>	Yes	Yes	Yes
Minnesota	18 <sup>§</sup>	Yes	Yes <sup>§§</sup>	No
Mississippi	18	Yes**	Yes	No
Missouri	No	No	No	No
Montana	No	No	No	No
Nebraska	18 <sup>§</sup>	Yes	Yes	No

Access to tobacco products

Requires signs posted at point of sale	Penalties <sup>7</sup>	Requires retail cigarette or tobacco license	Enforcement provisions	Prohibits cigarette vending machines accessible to minors
No	a	Yes	No	No
No	a	Yes	No	Yes
No	b	No	No	No
No	a	Yes	No	No
Yes	a	No	No	No
No	b	No	No	No
No	b	Yes	No	No
No	a	Yes	No	No
No	a	Yes	No	No
Yes	a	No	Yes <sup>8</sup>	No
No	b	Yes	No	No
No	b	No	No	No
No	a	No	No	Yes
Yes	a	Yes	No	No
Yes	b	No	No	Yes
No	a	Yes	No	No
No	a	Yes	No	No
No	No	No	No	No
No	No	No	No	No
Yes	b	No	No	Yes
No	a	Yes	No	No
Yes	b	Yes <sup>17</sup>	No	No
Yes	a	No	No	No
No	a	No <sup>18</sup>	No	Yes
No	a	No	No	No
No	No	No	No	No
No	No	Yes	No	No
No	a	No <sup>19</sup>	Yes <sup>8</sup>	No

Tobacco — Continued

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Nevada	18	Yes	Yes
New Hampshire	18 <sup>a</sup>	Yes	Yes
New Jersey	18	Yes	Yes
New Mexico	No	No	No
New York	18	Yes	No
North Carolina	17	Yes	Yes
North Dakota	18 <sup>a</sup>	Yes	Yes
Ohio	18	Yes	Yes
Oklahoma	18	Yes**	Yes
Oregon	18	Yes	Yes
Pennsylvania	18	Yes	Yes
Rhode Island	18	Yes	Yes
South Carolina	18	Yes	Yes
South Dakota	18 <sup>a</sup>	Yes	Yes
Tennessee	18	Yes	Yes
Texas	18	Yes	Yes
Utah	19 <sup>a</sup>	Yes	Yes
Vermont	17	Yes	Yes
Virginia	16 <sup>a</sup>	Yes	No
Washington	18	Yes	Yes
West Virginia	18 <sup>a</sup>	Yes	Yes
Wisconsin	18	Yes	No
Wyoming	No	No	No
<b>Total states with laws</b>	<b>45</b>	<b>45</b>	<b>43</b>

\*For purposes of this report, the District of Columbia is counted as a

<sup>a</sup>a = Both jail and fine; b = fine only.

<sup>b</sup>Prohibits possession of tobacco by minors.

<sup>c</sup>Provisions to encourage minors to divulge source of tobacco.

\*\*Applies only to cigarettes.

<sup>††</sup>Provides for license revocation.

<sup>§§</sup>Prohibits *all* free distribution of tobacco.

<sup>¶¶</sup>Licensing is done at the local level.

<sup>\*\*\*</sup>Provides a bounty to informers.

<sup>†††</sup>Only vending machines need to be licensed.

<sup>§§§</sup>Provides that a "sting" operation is not entrapment.

## Tobacco — Continued

No	b	No	No	No
Yes	b	Yes <sup>††</sup>	No	No
Yes	b	Yes <sup>††</sup>	Yes	No
No	No	No	No	No
Yes	a	Yes	No	No
No	a	Yes	No	No
No	a	Yes	No	No
Yes	a	Yes	No	No
No	a	Yes	Yes <sup>†***</sup>	No
No	a	No	No	No
No	a	Yes	No	No
Yes	b	Yes <sup>††</sup>	No	No
No	a	No	Yes <sup>***</sup>	No
Yes	b	No <sup>†††</sup>	No	No
Yes	a	No	Yes <sup>***</sup>	No
Yes	b	No	No	No
No	a	Yes	No	Yes
Yes	b	No	No	No
No	b	No	No	No
No	a	Yes	No	No
No	b	No	Yes <sup>†</sup>	No
Yes	b	No <sup>††</sup>	No	No
No	No	No	No	No
17	45	24	7	6

as a state.

*Tobacco —Continued*

local criminal or administrative proceedings for violations involving sales to minors). Seven state laws specify enforcement processes. Six states either require that cigarette vending machines be placed in areas inaccessible to minors or ban such machines completely.

*Reported by: Program Svcs Activity, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.*

**Editorial Note:** The development of state and local laws restricting minors' access to tobacco products is a potentially effective public health strategy to prevent tobacco use by teenagers (4). Adequate enforcement is the critical element in ensuring the effectiveness of these laws. In May 1990, the Office of Inspector General (IG), U.S. Department of Health and Human Services, completed a study of the enforcement of laws restricting the sale of tobacco to minors. The IG interviewed ASTHO-designated state tobacco prevention and control contacts and, in each state with minors' access laws, the state-designated National Crime Information Center contact. These persons reported the recorded violations of minors' access laws.

The IG found minimal enforcement of the laws; only five states could provide data on the citations for violations of the laws. In 1989, only 32 vendor violations were cited, even though an estimated 1 billion cigarette packs are sold each year in the United States to persons <18 years of age (5). In most states, local law-enforcement officials are responsible for enforcement of minors' access laws.

Several successful local enforcement/vendor education initiatives were identified by the IG (e.g., Minneapolis, Minnesota; Marquette County, Michigan; King County, Washington; and Solano County, California). Components of successful initiatives to enforce minors' access laws include the participation of government officials and business leaders; local licensing of vendors that includes revocation provisions for violations; establishment of civil penalties; posting of warning signs; restriction of vending machines; and use of "sting" operations (in which an underage person, sponsored by local authorities, purchases tobacco) (6).

In response to these findings, the Secretary of Health and Human Services has recommended model legislation for states to control minors' access to tobacco. This legislation 1) creates a licensing system similar to that used to control the sale of alcoholic beverages, 2) sets the minimum age of legal purchase at 19 years, 3) sets forth a graduated schedule of penalties for illegal sales to minors, 4) provides separate penalties for failure to post warning signs about the illegality of sales to minors, 5) places primary responsibility for enforcement with a designated state agency, 6) relies primarily on civil penalties rather than on the court system to punish offenders, and 7) bans the use of vending machines to dispense tobacco products (7). The proposed model legislation is intended to make the laws more enforceable and could be enacted at the state and/or local level.

Copies of the IG report and the model legislation proposed by the Secretary are available from CDC's Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion; telephone (301) 443-5287.

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*Tobacco — Continued*

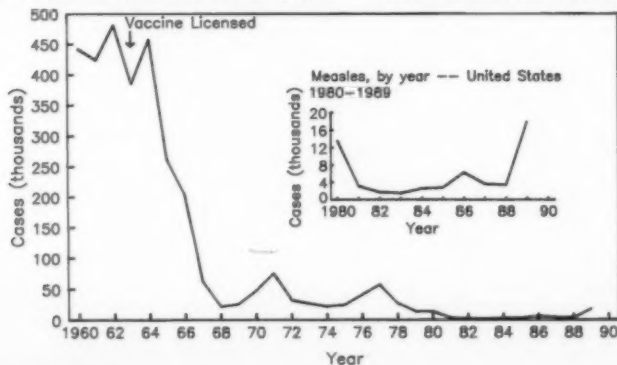
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Current Trends**Measles — United States, 1989 and First 20 Weeks 1990****MEASLES IN 1989**

As of May 11, 1990, local and state health departments reported a provisional total of 17,850\* measles cases for 1989—a 423% increase over the 3411 cases reported for 1988 (Figure 1). Forty-one measles-associated deaths have been reported for 1989. Forty-seven states and the District of Columbia reported cases, compared with 36 states that reported cases during 1988. The overall incidence rate in 1989 was 7.3 cases per 100,000 population—more than five times the rate of 1.4 per 100,000 for 1988 (1).

Twenty-three states reported at least 100 cases each. Four states reported >2500 cases each, accounting for 12,127 (67.9%) of the total reported cases: Illinois (3232), Texas (3201), California (3053), and Ohio (2641). Incidence rates of >10.0 per 100,000 population occurred in Illinois (27.8), Ohio (24.3), Texas (19.0), Wisconsin (16.7), Missouri (13.1), and California (10.8).

\*As of December 31, 1989, a total of 16,236 cases were officially reported to CDC. Through May 11, 1990, CDC's Division of Immunization, Center for Prevention Services, has received reports of 1614 additional cases reported to have occurred in 1989 for a provisional total of 17,850 cases. The final official total may differ slightly.

**FIGURE 1. Reported measles cases, by year — United States, 1960–1989\***

\*Provisional data for 1989.

*Measles — Continued*

A total of 16,734 (93.7%) cases met the clinical case definition for measles,<sup>†</sup> and 4420 (24.8%) were serologically confirmed. Importations from other countries accounted for 321 (1.8%) cases; an additional 222 (1.2%) cases were epidemiologically linked to imported cases.

Children <5 years of age accounted for 36.7% of measles cases, compared with 28.7% of cases in 1988 (Table 1). The estimated incidence rates for all age groups were higher in 1989 than in 1988. The largest increases in incidence rates were among adults aged 25–29 years (+600%) and children aged <1 year (+592%) and 1–4 years (+562%). The highest incidence rate was among children <1 year of age (51.9 per 100,000).

**Outbreaks**

A total of 248 outbreaks, each involving from five to 2440 persons, accounted for 79.4% of the cases. Outbreaks were classified based on the age group with the most cases (2). Fifty-six outbreaks involved predominantly preschool-aged (<5 years of age) children, 170 involved predominantly school-aged (5–19 years) persons, and 22 involved predominantly postschool-aged (≥20 years) persons. Outbreaks involving predominantly preschool-aged children accounted for 8007 (44.9%) cases; outbreaks involving predominantly school-aged persons, 5662 (31.7%); and outbreaks involving predominantly postschool-aged persons, 508 (2.8%).

Twenty-five outbreaks involved ≥100 cases each and accounted for 60% of the cases reported for 1989; nine were outbreaks involving predominantly preschool-aged children and ranged from 105 to 2440 cases. The largest outbreaks involving predominantly preschool-aged children occurred in Los Angeles (2440 cases), Chicago (2178 cases), and Houston (1434 cases) and accounted for 33.9% of all cases

<sup>†</sup>Fever ≥38.3 C (101 F), if measured; generalized rash lasting ≥3 days; and at least one of the following: cough, coryza, or conjunctivitis.

**TABLE 1. Reported measles cases and estimated incidence rates\* of measles, by patient age — United States, 1988, 1989, and first 20 weeks 1990**

Age group (yrs)	1988			1989			Rate change (1988 to 1989) (%)	1990	
	No.	(%)	Rate	No.	(%)	Rate		No.	(%)
<1	288	( 8.4)	7.5	2,003	( 11.2)	51.9	(+592)	675	( 13.0)
1–4	690	( 20.2)	4.7	4,544	( 25.5)	31.1	(+562)	1,512	( 29.2)
5–9	312	( 9.1)	1.7	1,711	( 9.6)	9.5	(+459)	587	( 11.3)
10–14	576	( 16.9)	3.5	2,238	( 12.5)	13.5	(+286)	585	( 11.3)
15–19	1,054	( 30.9)	5.8	4,340	( 24.3)	23.8	(+310)	765	( 14.8)
20–24	252	( 7.4)	1.3	1,518	( 8.5)	7.9	(+508)	493	( 9.5)
25–29	116	( 3.4)	0.5	755	( 4.2)	3.5	(+600)	277	( 5.3)
≥30	123	( 3.6)	0.1	733	( 4.1)	0.5	(+400)	276	( 5.3)
<b>Total</b>	<b>3,411</b>	<b>(100.0)</b>	<b>1.4</b>	<b>17,850<sup>†</sup></b>	<b>(100.0)</b>	<b>7.3</b>	<b>(+421)</b>	<b>5,180<sup>‡</sup></b>	<b>(100.0)</b>

\*Per 100,000 population, based on provisional data for both years.

<sup>†</sup>Age unavailable for eight persons.

<sup>‡</sup>A provisional 7653 cases have been reported; detailed information is available for 5180 cases. Age is unavailable for 10 of those persons.



*Measles — Continued*

reported for 1989. Sixteen outbreaks involving predominantly school-aged children, ranging from 100 to 437 cases, accounted for 3277 (18.4%) cases.

**Complications**

Complications were reported in 3107 (17.4%) cases, including diarrhea in 1140 (6.4%), otitis media in 1077 (6.0%), pneumonia in 867 (4.9%), and encephalitis in 29 (0.2%). Hospitalization was reported for 2819 (15.8%) persons.

A provisional total of 41 measles-associated deaths were reported, for a case-fatality rate of 2.3 deaths per 1000 reported cases. Deaths were reported from five states (California [17], Illinois [11], Texas [10], and Missouri and Wisconsin [one each]) and the District of Columbia (one), and occurred primarily in outbreaks among preschool-aged children. Twenty-nine (70.7%) deaths occurred among children <5 years of age, including nine (22.0%) <12 months of age; two deaths were in 11-year-olds. Twenty-nine (93.5%) of these 31 children were unvaccinated. Two children, one of whom had been vaccinated, had serious underlying disease (one case each of leukemia and congenital neurologic defects). The remaining 10 deaths occurred in adults aged 19–33 years. Nine of these patients were unvaccinated. Three had underlying medical conditions (one each with leukemia, scleroderma [not on steroids], and diabetes mellitus). Most deaths were attributed to pneumonia.

**Vaccination Status**

Of reported patients, 7149 (40.1%) were known to have been vaccinated on or after their first birthday (Table 2). Approximately 79% of appropriately vaccinated persons with measles were 5–19 years of age. The remaining 10,654 (59.7%) persons with measles were unvaccinated or inadequately vaccinated (i.e., vaccinated before their first birthday). Of these persons, routine vaccination was indicated for 6073 (57.0%)

(Continued on page 361)

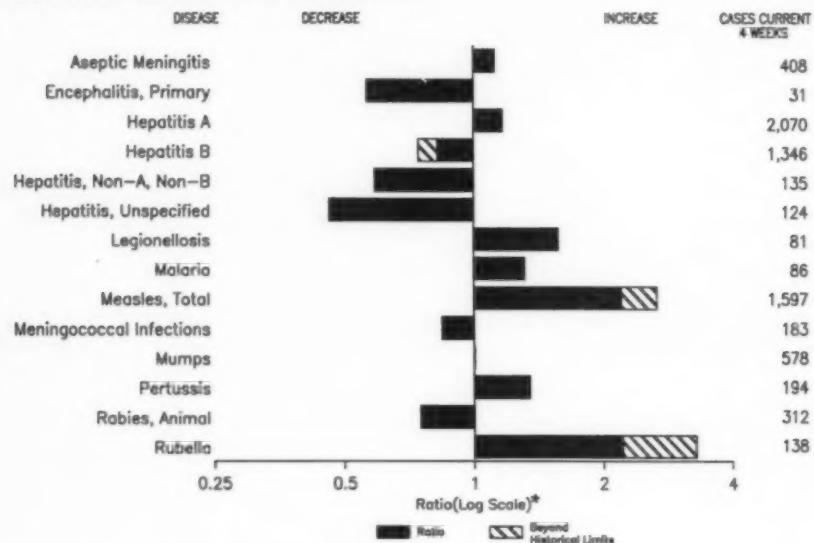
**TABLE 2. Classification of measles cases — United States, 1989 and first 20 weeks 1990\***

Classification	1989		1990	
	No.	% of total	No.	% of total
Unvaccinated	10,654	( 59.7)	3,695	( 71.3)
Vaccine indicated	6,073	( 34.0)	1,839	( 35.5)
Routine vaccination not indicated	3,699	( 20.7)	1,252	( 24.2)
Persons <16 mos. of age	3,203	( 17.9)	1,085	( 20.9)
Persons born before 1957	426	( 2.4)	142	( 2.7)
Laboratory immunity/ Physician diagnosis	22	( 0.1)	4	( 0.1)
Medical exemption	48	( 0.3)	21	( 0.4)
Other	882	( 4.9)	604	( 11.7)
Non-U.S. citizen	101	( 0.6)	45	( 0.9)
Religious/philosophic exemption	781	( 4.4)	559	( 10.8)
Appropriately vaccinated†	7,149	( 40.1)	1,483	( 28.6)
Subtotal	17,803	( 99.7)	5,178	( 99.9)
Unknown	47	( 0.3)	2	( <0.1)
TOTAL	17,850	(100.0)	5,180 <sup>‡</sup>	(100.0)

\*Provisional data for both periods.

†Vaccinated with live measles vaccine on or after the first birthday.

‡A provisional 7653 cases have been reported; detailed information is available for 5180.

**FIGURE I. Notifiable disease reports, comparison of 4-week totals ending May 26, 1990, with historical data — United States**

\*Ratio of current 4-week total to mean of 15 4-week totals (from comparable, previous, and subsequent 4-week periods for past 5 years).

**TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending May 26, 1990 (21st Week)**

	Cum. 1990		Cum. 1990
AIDS	17,998	Plague	-
Anthrax	-	Polio myelitis, Paralytic*	-
Botulism: Foodborne	1	Psittacosis	56
Infant	17	Rabies, human	-
Other	2	Syphilis: civilian	19,435
Brucellosis	15	military	113
Cholera	1	Syphilis, congenital, age < 1 year	-
Congenital rubella syndrome	1	Tetanus	20
Diphtheria	1	Toxic shock syndrome	140
Encephalitis, post-infectious	37	Trichinosis	13
Gonorrhea: civilian	254,754	Tuberculosis	7,939
military	3,659	Tularemia	22
Leprosy	74	Typhoid fever	139
Leptospirosis	15	Typhus fever, tickborne (RMSF)	63
Measles: Imported	546		
indigenous	7,218		

\*Two cases of suspected poliomyelitis have been reported in 1990; none of 13 suspected cases in 1989 have been confirmed to date. Nine of 14 suspected cases in 1988 were confirmed and all were vaccine-associated.

**TABLE II. Cases of specified notifiable diseases, United States, weeks ending May 26, 1990, and May 27, 1989 (21st Week)**

Reporting Area	AIDS	Asptic Meningitis	Encephalitis		Gonorrhea (Chlamydia)		Hepatitis (Viral), by type				Legionel- losis	Leprosy
			Primary	Post-in- fectious			A	B	NA, NB	Unspec- ified		
	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	17,998	1,895	246	37	264,754	267,007	11,843	8,197	778	707	437	74
NEW ENGLAND	684	80	8	-	7,344	7,801	246	410	22	34	20	5
Maine	22	2	1	-	93	113	4	17	3	1	1	-
N.H.	43	7	-	-	80	71	5	22	2	3	3	-
Vt.	7	9	2	-	27	25	2	25	3	-	4	-
Mass.	376	27	1	-	2,880	3,074	181	270	9	30	8	4
R.I.	34	23	-	-	440	556	28	22	-	1	4	1
Conn.	202	12	4	-	3,824	3,962	28	54	5	-	-	-
MID. ATLANTIC	5,782	238	19	3	36,141	43,905	1,771	1,319	92	52	109	14
Upstate N.Y.	825	106	18	1	5,429	6,594	394	281	14	17	47	1
N.Y. City	3,415	49	1	-	14,801	18,847	215	436	15	20	16	10
N.J.	1,022	-	-	-	5,855	5,619	182	277	23	-	10	2
Pa.	519	83	-	2	10,056	12,846	980	325	40	15	36	1
E.N. CENTRAL	1,189	298	61	6	51,899	45,619	869	1,091	52	52	107	-
Ohio	282	75	15	2	15,843	11,676	101	196	14	7	37	-
Ind.	95	55	2	2	4,193	3,174	71	267	5	17	19	-
Ill.	491	52	21	2	16,471	13,931	391	163	16	13	7	-
Mich.	218	99	21	-	12,566	12,853	173	291	15	15	31	-
Wis.	103	15	2	-	2,827	3,985	133	174	2	-	13	-
W.N. CENTRAL	412	82	18	1	14,342	12,067	681	384	45	15	25	-
Minn.	58	8	9	1	1,781	1,244	105	43	14	-	-	-
Iowa	20	10	2	-	1,104	1,021	152	31	2	2	2	-
Mo.	252	35	1	-	8,427	7,083	238	234	12	10	17	-
N. Dak.	-	7	-	-	47	58	6	4	2	1	-	-
S. Dak.	1	3	2	-	82	111	36	4	1	-	-	-
Neb.	23	9	3	-	738	702	41	16	2	-	3	-
Kans.	58	10	1	-	2,163	1,848	103	52	12	2	3	-
S. ATLANTIC	3,838	462	59	12	74,418	72,640	1,438	1,493	114	100	68	3
Del.	40	15	3	-	1,263	1,152	60	40	3	1	4	-
Md.	397	63	7	1	7,862	8,099	590	208	16	4	21	1
D.C.	255	2	-	-	3,659	4,058	10	26	4	-	-	-
Va.	338	70	20	2	7,341	6,080	114	93	15	83	6	-
W. Va.	24	8	5	-	532	529	9	40	3	1	1	-
N.C.	261	42	18	-	12,401	11,097	278	439	52	-	11	1
S.C.	141	7	-	-	6,054	6,420	19	232	8	6	8	-
Ga.	571	61	3	1	16,660	14,403	131	168	3	6	11	-
Fla.	1,821	194	3	8	18,546	20,353	227	249	10	8	4	1
E.S. CENTRAL	399	150	21	-	22,860	21,286	149	612	47	3	34	-
Ky.	79	40	5	-	2,344	2,025	40	208	15	2	15	-
Tenn.	123	31	12	-	7,128	6,824	72	325	20	-	10	-
Ala.	102	58	4	-	7,844	6,897	36	75	10	-	9	-
Miss.	95	21	-	-	5,344	5,540	1	4	2	1	-	-
W.S. CENTRAL	1,867	134	9	4	26,038	27,847	1,143	652	65	103	29	17
Ark.	145	5	-	-	3,388	2,809	212	31	3	9	7	-
La.	298	18	3	-	5,350	5,969	59	119	1	3	9	-
Okla.	97	11	1	4	2,428	2,406	254	82	14	10	10	-
Tex.	1,327	100	5	-	14,870	16,663	618	440	47	81	3	17
MOUNTAIN	438	80	7	-	4,893	5,523	1,901	597	59	58	23	-
Mont.	4	1	-	-	71	89	48	34	2	3	1	-
Idaho	14	-	-	-	43	88	36	34	8	-	3	-
Wyo.	2	1	1	-	74	48	21	8	3	-	-	-
Colo.	107	21	1	-	1,081	1,299	117	77	16	20	3	-
N. Mex.	40	3	-	-	501	561	270	80	2	2	2	-
Ariz.	161	30	3	-	2,204	1,882	1,109	187	15	25	8	-
Utah	46	14	-	-	173	178	142	37	10	3	1	-
Nev.	64	10	2	-	746	1,388	158	180	3	5	5	-
PACIFIC	3,389	373	44	11	27,221	30,319	3,645	1,639	262	281	24	35
Wash.	273	-	3	1	2,302	2,525	617	257	54	9	7	-
Oreg.	142	-	-	-	1,048	1,165	406	189	17	5	-	-
Calif.	2,908	338	37	9	23,276	26,057	2,506	1,138	204	264	16	27
Alaska	17	7	3	-	435	364	75	31	3	-	-	-
Hawaii	49	28	1	1	180	208	41	24	4	3	1	6
Guam	1	-	-	-	71	58	3	1	-	5	-	-
P.R.	661	30	4	-	347	483	58	84	-	19	-	-
V.I.	5	-	-	-	181	255	-	6	-	-	-	-
Amer. Samoa	-	1	-	-	28	11	12	-	-	-	-	5
C.N.M.I.	-	-	-	-	64	38	4	2	-	-	-	1

N: Not notifiable

U: Unavailable

C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending May 26, 1990, and May 27, 1989 (21st Week)

Reporting Area	Malaria		Measles (Rubella)				Meningococcal Infections		Mumps		Pertussis			Rubella		
	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	1990	Cum. 1990	Cum. 1989	1990
UNITED STATES	384	40	7,218	1	548	6,083	1,200	98	2,538	41	1,102	917	60	403	148	
NEW ENGLAND	39	-	107	-	13	256	77	-	18	2	143	181	-	4	5	
Maine	-	-	27	-	-	-	8	-	-	-	4	4	-	-	-	
N.H.	4	-	-	-	8	2	2	-	6	-	10	5	-	1	3	
Vt.	4	-	-	-	1	1	5	-	1	-	6	5	-	-	1	
Mass.	22	-	4	-	1	35	40	-	6	2	114	162	-	-	1	
R.I.	3	-	27	-	3	37	5	-	3	-	-	2	-	1	-	
Conn.	6	-	49	-	-	181	17	-	2	-	9	3	-	2	-	
MID. ATLANTIC	82	-	485	-	128	605	180	3	152	3	281	50	-	2	10	
Upstate N.Y.	16	-	155	-	101	104	71	1	64	3	228	25	-	1	2	
N.Y. City	30	-	43	-	15	49	23	-	-	-	-	2	-	-	6	
N.J.	21	-	22	-	5	349	34	-	30	-	11	19	-	-	2	
Pa.	18	-	275	-	7	103	52	2	58	-	42	4	-	1	-	
E.N. CENTRAL	18	-	2,147	-	138	1,293	167	12	276	8	216	106	-	23	20	
Ohio	4	-	213	-	2	492	57	7	54	8	62	1	-	-	3	
Ind.	-	-	229	-	1	17	17	-	14	-	31	8	-	-	-	
Ill.	6	-	670	-	8	746	38	-	86	-	63	41	-	14	16	
Mich.	5	-	265	-	125	5	37	5	92	-	33	20	-	9	-	
Wis.	3	-	570	-	2	33	18	-	30	-	27	36	-	-	1	
W.N. CENTRAL	5	33	336	-	12	485	38	1	73	-	27	23	-	2	4	
Minn.	1	-	120	-	3	3	9	-	-	-	-	-	-	-	-	
Iowa	-	-	22	-	-	1	1	1	12	-	4	9	-	1	-	
Mo.	4	-	49	-	-	296	13	-	37	-	17	12	-	-	3	
N. Dak.	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	
S. Dak.	-	6	13	-	8	-	2	-	-	-	1	-	-	-	-	
Nebr.	-	-	26	-	1	110	5	-	2	-	1	-	-	-	-	
Kans.	-	27	106	-	-	76	8	-	22	-	3	1	-	-	1	
S. ATLANTIC	83	2	448	-	77	300	225	46	980	-	102	75	-	12	5	
Del.	2	2	8	-	3	32	1	1	2	-	2	1	-	-	-	
Md.	21	-	66	-	12	33	22	39	569	-	25	6	-	1	2	
D.C.	9	-	8	-	7	9	11	-	20	-	13	-	-	1	-	
Va.	18	-	48	-	2	11	26	3	58	-	9	4	-	-	-	
W. Va.	1	-	6	-	-	-	7	-	38	-	9	10	-	-	-	
N.C.	6	-	3	-	1	164	35	2	107	-	18	17	-	-	1	
S.C.	6	-	3	-	-	-	15	1	18	-	5	-	-	-	-	
Ge.	7	-	6	-	12	-	47	-	56	-	14	9	-	-	-	
Fla.	19	-	300	-	40	51	61	-	112	-	7	28	-	10	2	
E.S. CENTRAL	11	3	89	-	2	53	67	2	58	6	56	39	-	1	2	
Ky.	2	-	4	-	-	2	19	-	-	-	-	-	-	-	-	
Tenn.	6	2	32	-	-	22	25	1	26	2	24	14	-	1	2	
Ala.	3	1	7	-	2	29	21	-	9	4	30	20	-	-	-	
Miss.	-	-	26	-	-	-	2	N	N	-	2	4	-	-	-	
W.S. CENTRAL	12	-	1,160	-	53	2,277	80	11	470	2	23	23	-	1	11	
Ark.	-	-	8	-	15	-	7	3	113	-	1	10	-	1	-	
La.	-	-	10	-	-	6	24	1	78	2	4	4	-	-	5	
Okla.	8	-	136	-	-	50	9	1	97	-	18	9	-	-	1	
Tex.	7	-	1,008	-	38	2,231	40	6	182	-	-	-	-	-	6	
MOUNTAIN	10	2	391	1	58	105	34	7	205	1	102	305	26	51	4	
Mont.	-	-	-	-	1	13	7	-	1	-	-	-	-	13	1	
Idaho	2	-	15	-	5	1	3	-	108	-	21	40	12	19	2	
Wyo.	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	
Colo.	1	1	44	1†	29	33	11	-	15	-	47	18	-	3	-	
N. Mex.	1	1	70	-	8	29	3	N	N	-	7	4	-	-	-	
Ariz.	6	-	123	-	11	29	2	7	67	-	13	237	14	14	-	
Utah	-	-	4	-	-	-	4	-	4	-	5	5	-	1	-	
Nev.	-	-	135	-	3	-	4	-	11	-	4	1	-	1	1	
PACIFIC	124	-	2,065	-	66	708	332	18	305	19	152	115	34	307	87	
Wash.	12	-	7	-	38	33	41	6	27	6	39	23	-	-	-	
Orege.	4	-	-	-	-	6	36	N	N	-	3	5	-	-	1	
Calif.	106	-	1,980	-	25	656	247	10	274	12	93	85	34	300	66	
Alaska	1	-	75	-	2	-	6	-	-	-	-	-	-	-	-	
Hawaii	1	-	3	-	1	13	2	-	4	1	17	2	-	7	20	
Guam	1	U	-	U	-	1	-	U	-	U	-	1	U	-	-	
P.R.	-	-	808	-	-	374	6	-	3	-	4	2	-	-	4	
V.I.	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-	
C.N.M.I.	-	U	-	U	-	-	-	U	5	U	-	-	U	-	-	

\*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International ‡Out-of-state

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending May 26, 1990, and May 27, 1989 (21st Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic- shock Syndrome	Tuberculosis		Tula- remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1990	Cum. 1989	Cum. 1989	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	19,435	16,516	140	7,939	7,996	22	139	63	1,514
NEW ENGLAND	775	665	11	197	196	-	11	-	3
Maine	5	5	3	-	3	-	-	-	2
N.H.	32	3	1	3	14	-	-	-	-
Vt.	1	-	-	2	4	-	-	-	-
Mass.	289	197	6	105	97	-	10	-	-
R.I.	5	14	-	30	26	-	1	-	1
Conn.	443	446	1	57	52	-	1	-	-
MID. ATLANTIC	4,154	3,425	13	1,930	1,587	1	40	3	341
Upstate N.Y.	324	327	4	26	135	-	8	-	15
N.Y. City	1,902	1,391	4	1,219	913	-	21	-	104
N.J.	614	540	-	360	236	1	9	3	222
Pa.	1,314	1,158	5	325	303	-	2	-	-
E.N. CENTRAL	1,270	614	40	816	864	-	19	4	34
Ohio	201	44	19	107	169	-	5	2	-
Ind.	13	26	2	46	73	-	-	-	11
Ill.	512	282	5	413	380	-	10	-	5
Mich.	400	228	14	217	195	-	3	2	15
Wis.	144	34	-	33	46	-	1	-	-
W.N. CENTRAL	173	129	16	213	219	6	-	7	224
Minn.	43	10	-	39	45	-	-	-	91
Iowa	22	18	2	24	28	-	-	-	8
Mo.	84	72	11	101	87	5	-	6	31
N. Dak.	1	1	-	10	9	-	-	-	55
S. Dak.	1	-	-	10	10	1	-	-	3
Nebr.	6	16	2	23	28	-	-	1	26
Kans.	16	14	-	-	-	-	-	-	-
S. ATLANTIC	6,144	5,944	6	1,559	1,647	3	12	19	432
Del.	77	72	1	18	19	-	-	1	7
Md.	481	317	-	145	145	-	6	-	164
D.C.	330	381	-	44	67	-	-	-	-
Va.	341	224	-	123	147	1	-	-	83
W. Va.	6	7	-	30	33	-	-	-	12
N.C.	720	370	3	199	179	1	-	14	2
S.C.	331	298	1	186	173	1	-	3	53
Ga.	1,562	1,266	-	235	230	-	1	1	85
Fla.	2,296	3,009	1	579	654	-	5	-	26
E.S. CENTRAL	1,726	1,082	5	848	695	2	-	9	84
Ky.	28	23	-	164	155	-	-	-	24
Tenn.	721	460	3	178	197	2	-	7	22
Ala.	537	368	2	218	204	-	-	2	38
Miss.	440	231	-	88	139	-	-	-	-
W.S. CENTRAL	3,112	2,156	7	1,012	931	8	3	18	207
Ark.	179	138	-	102	98	5	-	1	12
La.	961	487	1	115	125	-	-	-	-
Okla.	89	32	6	79	80	3	1	14	62
Tex.	1,893	1,499	-	718	628	-	2	2	133
MOUNTAIN	367	277	18	190	199	1	7	2	66
Mont.	-	-	-	10	7	-	-	-	18
Idaho	6	-	1	8	8	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	27
Colo.	20	51	5	6	17	-	-	-	4
N. Mex.	20	12	4	43	33	1	-	2	15
Ariz.	253	76	5	90	93	-	5	-	-
Utah	4	10	2	12	19	-	-	-	2
Nev.	64	128	-	23	22	-	2	-	-
PACIFIC	1,714	2,224	24	1,374	1,658	1	47	1	123
Wash.	146	169	3	107	78	1	1	-	-
Oreg.	55	113	-	49	56	-	1	-	-
Calif.	1,501	1,934	20	1,138	1,432	-	42	1	107
Alaska	5	2	-	17	27	-	-	-	16
Hawaii	7	6	1	63	65	-	3	-	-
Guam	1	3	-	14	30	-	-	-	19
P.R.	263	224	-	29	119	-	-	-	-
V.I.	1	1	-	3	3	-	-	-	-
Amer. Samoa	-	-	-	6	2	-	-	-	-
C.N.M.I.	1	3	-	13	7	-	4	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,\* week ending  
May 26, 1990 (21st Week)

Reporting Area	All Causes, By Age (Years)						P&I**	Total	Reporting Area	All Causes, By Age (Years)						P&I**	Total
	All Ages	>=65	45-64	25-44	1-24	<1				All Ages	>=65	45-64	25-44	1-24	<1		
NEW ENGLAND	859	374	111	44	11	19	53		S. ATLANTIC	1,237	741	286	124	42	41	61	
Boston, Mass.	178	103	38	17	9	11	29		Atlanta, Ga.	160	79	47	24	7	3	5	
Bridgeport, Conn.	31	19	10	1	-	1	2		Baltimore, Md.	186	118	52	10	3	3	13	
Cambridge, Mass.	19	14	3	1	1	-	2		Charlotte, N.C.	65	44	14	1	-	5	4	
Fall River, Mass.	26	22	4	-	-	-	-		Jacksonville, Fla.	120	73	22	11	9	5	8	
Hartford, Conn.	51	30	12	9	-	-	4		Miami, Fla.	110	68	19	16	4	3	-	
Lowell, Mass.	15	12	1	-	1	1	-		Norfolk, Va.	61	33	17	9	1	1	4	
Lynn, Mass.	14	11	1	2	-	-	3		Richmond, Va.	63	31	21	6	2	3	5	
New Bedford, Mass.	22	20	2	-	-	-	2		Savannah, Ga.	62	37	18	3	3	1	5	
New Haven, Conn.	28	19	6	2	-	1	-		St. Petersburg, Fla.	69	59	6	2	-	2	4	
Providence, R.I.	44	34	7	2	-	1	4		Tampa, Fla.	95	62	14	12	3	2	5	
Somerville, Mass.	10	6	3	1	-	-	-		Washington, D.C.	229	123	53	30	10	13	8	
Springfield, Mass.	38	21	9	6	-	2	2		Wilmington, Del.	17	14	3	-	-	-	-	
Waterbury, Conn.	28	20	6	2	-	-	2										
Worcester, Mass.	55	43	9	1	-	-	2	3									
MID. ATLANTIC	2,569	1,650	518	276	65	60	148		E.S. CENTRAL	745	495	156	52	23	18	39	
Albany, N.Y.	41	29	6	4	1	1	-		Birmingham, Ala.	131	82	28	11	4	6	5	
Allentown, Pa.	18	14	1	3	-	-	-		Chattanooga, Tenn.	70	53	13	3	1	-	2	
Buffalo, N.Y.	104	71	22	5	3	3	5		Knoxville, Tenn.	68	44	18	4	-	2	4	
Camden, N.J.	43	27	11	2	2	1	-		Louisville, Ky.	57	37	12	3	3	2	1	
Elizabeth, N.J.	26	14	9	3	-	-	3		Memphis, Tenn.	150	99	36	10	5	-	7	
Erie, Pa.	34	25	7	-	1	1	2		Mobile, Ala.	116	79	19	9	5	3	1	
Jersey City, N.J.	53	27	12	10	-	4	1		Montgomery, Ala.	56	42	9	3	2	-	5	
N.Y. City, N.Y.	1,399	858	292	182	39	28	60		Nashville, Tenn.	97	59	21	9	3	5	14	
Newark, N.J.	74	36	15	14	5	4	9										
Peterborough, N.J.	25	9	13	2	1	-	2		W.S. CENTRAL	1,818	1,135	386	183	63	81	94	
Philadelphia, Pa.	296	189	62	26	8	9	21		Austin, Tex.	58	31	14	6	2	5	3	
Pittsburgh, Pa.	58	39	14	3	1	1	1		Baton Rouge, La.	28	18	3	5	1	1	1	
Reading, Pa.	29	25	3	-	1	-	5		Corpus Christi, Tex.	68	43	13	8	1	3	2	
Rochester, N.Y.	125	97	16	6	2	4	20		Dallas, Tex.	199	133	37	19	7	3	8	
Schenectady, N.Y.	29	27	2	-	-	-	2		El Paso, Tex.	70	45	14	7	2	2	5	
Scranton, Pa.	28	21	4	3	-	-	1		Fort Worth, Tex.	135	78	33	10	4	10	12	
Syracuse, N.Y.	97	70	14	8	1	4	8		Houston, Tex.	734	436	169	89	24	16	18	
Trenton, N.J.	34	24	9	-	-	-	2		Little Rock, Ark.	74	51	13	5	1	4	5	
Utica, N.Y.	18	1	-	-	-	-	2		New Orleans, La.	124	78	25	8	12	1	-	
Yonkers, N.Y.	37	30	5	2	-	-	6		San Antonio, Tex.	198	127	41	18	7	5	23	
									Shreveport, La.	58	43	9	4	2	-	10	
									Tulsa, Okla.	72	52	15	4	-	1	7	
E.N. CENTRAL	2,260	1,511	429	180	66	84	99		MOUNTAIN	597	406	121	35	14	20	44	
Akron, Ohio	89	67	13	5	1	3	-		Albuquerque, N. Mex.	73	52	12	4	1	3	2	
Canton, Ohio	36	28	6	2	-	-	-		Colo. Springs, Colo.	31	23	6	1	-	1	4	
Chicago, Ill.	564	382	125	45	10	22	16		Denver, Colo.	84	57	20	6	-	1	3	
Cincinnati, Ohio	119	76	25	9	3	6	17		Las Vegas, Nev.	110	65	29	9	3	4	8	
Cleveland, Ohio	175	114	37	11	4	9	4		Ogden, Utah	26	18	4	1	1	2	1	
Columbus, Ohio	159	105	25	15	7	7	2		Phoenix, Ariz.	111	75	22	5	4	5	12	
Dayton, Ohio	133	83	25	9	2	4	6		Pueblo, Colo.	17	14	3	-	-	-	-	
Detroit, Mich.	227	137	40	35	6	9	7		Salt Lake City, Utah	41	23	9	4	3	2	6	
Evansville, Ind.	41	31	4	2	1	3	1		Tucson, Ariz.	104	79	16	5	2	2	8	
Fort Wayne, Ind.	51	37	7	4	-	3	1										
Gary, Ind.	11	4	1	5	1	-	-		PACIFIC	1,999	1,248	403	216	68	55	104	
Grand Rapids, Mich.	47	35	9	1	1	1	4		Berkeley, Calif.	24	16	3	5	-	-	-	
Indianapolis, Ind.	144	84	39	13	5	3	2		Fresno, Calif.	70	45	15	4	5	1	5	
Madison, Wis.	39	21	11	4	1	2	4		Glendale, Calif.	21	18	3	-	-	-	2	
Milwaukee, Wis.	127	99	16	4	5	3	6		Honolulu, Hawaii	86	55	21	7	2	1	11	
Peoria, Ill.	36	31	4	-	-	1	4		Long Beach, Calif.	82	56	13	8	3	2	10	
Rockford, Ill.	63	41	4	5	-	-	1		Los Angeles Calif.	589	349	118	84	24	5	26	
South Bend, Ind.	50	40	5	2	1	2	6		Oakland, Calif.	70	36	14	10	1	9	3	
Toledo, Ohio	91	56	22	4	4	5	6		Pasadena, Calif.	26	20	2	2	-	-	2	
Youngstown, Ohio	68	50	11	5	1	1	12		Portland, Ore.	157	105	34	12	3	3	7	
									Sacramento, Calif.	149	95	33	12	3	6	15	
W.N. CENTRAL	750	525	153	44	13	15	41		San Diego, Calif.	143	80	40	13	6	4	6	
Des Moines, Iowa	70	49	15	4	1	1	6		San Francisco, Calif.	170	93	35	27	3	12	4	
Duluth, Minn.	30	23	6	-	1	-	2		San Jose, Calif.	163	105	39	11	5	3	9	
Kansas City, Kans.	39	29	6	2	-	-	2		Seattle, Wash.	139	92	18	17	7	5	2	
Kansas City, Mo.	100	70	23	7	-	-	5		Spokane, Wash.	52	43	2	3	2	2	3	
Lincoln, Nebr.	38	26	9	3	-	-	6		Tacoma, Wash.	58	40	13	1	4	-	1	
Minneapolis, Minn.	154	110	27	7	4	6	7										
Omaha, Nebr.	67	44	17	5	-	1	3										
St. Louis, Mo.	135	94	25	10	-	2	2										
St. Paul, Minn.	63	45	11	4	-	3	2										
Wichita, Kans.	54	35	12	2	3	2	1										
									TOTAL	12,534**	8,085	2,563	1,154	355	263	683	

\*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fatal deaths are not included.

\*\*Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

‡Data not available. Figures are estimates based on average of past available 4 weeks.

*Measles - Continued*

[34.0% of total]]. Almost 40% of these vaccine-eligible persons were children 16 months to 4 years of age. Measles occurred in 3699 (20.7%) persons for whom routine vaccination was not indicated; 3203 (17.9% of total) children were <16 months of age. Eight hundred eighty-two (4.9%) were unvaccinated for other reasons.

**MEASLES IN 1990 (FIRST 20 WEEKS)**

For the first 20 weeks of 1990 (January 1–May 19), a provisional total of 7653 measles cases was reported, a 39.6% increase over the 5484 cases reported for the same period in 1989 (Figure 2). Cases have been reported from 48 states and the District of Columbia.

Detailed information has been provided on 5180 (67.7%) of the 7653 cases. Of these 5180 patients, 2187 (42.2%) were children <5 years of age, including 675 (13.0% of total) <12 months of age (Table 1).

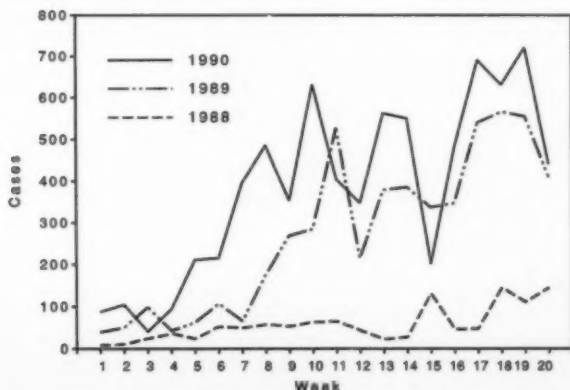
Vaccination status was reported for 5178 patients (Table 2). Of these, 1483 (28.6%) were appropriately vaccinated, and 3695 (71.3%) were unvaccinated. Among the unvaccinated patients, routine vaccination was indicated for 1839 (49.8% [35.5% of total]). Routine vaccination was not indicated for 1252 (24.2%) patients. Although most of these were children <16 months of age (86.7%), 604 (11.7%) patients were unvaccinated for other reasons (e.g., religious or philosophic exemptions).

At least 88 measles outbreaks are known to be occurring in 25 states. These outbreaks involve preschool-aged children (seven outbreaks); school-aged children (five); college students (10); and other groups (66), such as migrant farm workers and Amish populations. The largest outbreak is occurring in Dallas, where an estimated 2900 confirmed and suspected cases have been reported since December 1, 1989. This outbreak involves primarily unvaccinated preschool-aged children. Outbreaks among preschool-aged children are also continuing in Chicago, Los Angeles, and Milwaukee.

Since January 1, 35 suspected measles-associated deaths have been reported. Most deaths have occurred in unvaccinated preschool-aged children.

*Reported by: Div of Immunization, Center for Prevention Svcs, CDC.*

**FIGURE 2. Reported measles cases, by week – United States, first 20 weeks 1988, 1989, and 1990**





*Measles -- Continued*

**Editorial Note:** The provisional total of 17,850 measles cases reported in 1989 is the largest number reported since 1978. This marked increase in disease incidence has continued through early 1990. The 1990 total is likely an underestimate; reports from high-incidence areas (e.g., Dallas and Los Angeles) indicate that 2-3 times more cases have occurred than have been officially reported through local and state health departments to CDC.

In addition to the increased incidence of measles in all age groups during 1989-1990, the age distribution of cases has changed from the observed in previous years. From 1988 to 1989 the proportion of patients <5 years of age increased from 28.6% to 36.7%. For the first 20 weeks of 1990, 42.3% of patients were in this age group. In comparison, a median of 28.5% of patients reported during 1980-1988 were in this age group. Conversely, the proportion of school-aged persons with measles decreased. During 1980-1988, a median of 53.3% of reported cases were in persons 5-19 years of age, compared with 46.4% in 1989; more than half of the patients in this age group were 15-19 years old. In the prevaccine era, >50% of reported measles patients were 5-9 years old; in 1989-1990, this age group represented approximately 10% of total measles cases.

As in 1988, primarily two types of outbreaks occurred in 1989: those among unvaccinated preschool-aged children and those among highly vaccinated (>90%) school- and college-aged populations. During 1985-1988, most cases were reported from outbreaks involving predominantly school-aged children; a median of 47 outbreaks involving predominantly school-aged children occurred annually, accounting for a median of 51% of all reported measles cases. Also during this period, a median of eight outbreaks involving predominantly preschool-aged children occurred annually, accounting for a median of 20% of reported cases (3). Although the number and size of both types of outbreaks increased in 1989, the relative impact of these outbreaks changed. In 1989, 45% of all cases were reported from outbreaks involving predominantly preschool-aged children, while only 32% occurred in outbreaks involving predominantly school-aged children.

The 41 deaths in 1989 are the largest number reported in one year since 1971, when 90 deaths and 75,290 measles cases were reported. Measles-associated deaths were primarily occurring among unvaccinated preschool-aged children and adults—groups known to be at increased risk for both complications of measles and death (4). Reasons for the apparent increase in the case-fatality rate are unclear but may include the higher proportion of cases occurring among younger age groups; underreporting of less severe cases, particularly in the large outbreaks involving predominantly preschool-aged children; and potential undiagnosed underlying disease in these persons.

The increase in unvaccinated persons with measles reported for 1989 primarily reflected the increasing number of cases reported among unvaccinated inner-city preschool-aged children; to a lesser extent, this trend reflected an increase in cases among children younger than the recommended age for vaccination and among persons with religious or philosophic exemptions to vaccination (5,6). Prevention of outbreaks among preschool-aged children will require intensive efforts to increase age-appropriate vaccination levels in inner-city preschool-aged children and to decrease the age of vaccination to 12 months in some high-risk areas (7).

In addition to the increase in cases among unvaccinated persons, a large number of cases were reported among persons who were appropriately vaccinated. Approx-



*Measles - Continued*

imately 2%-5% of persons who receive a single dose of measles vaccine at  $\geq 15$  months of age will not develop protective immunity (i.e., vaccine failure). If measles virus circulates at relatively low levels, as occurred from 1981 through 1988, then the risk of measles among persons who fail to respond to a single dose of vaccine will be small and these persons will accumulate in the population. Consequently, when measles virus is introduced into environments where large numbers of vaccinated persons congregate (e.g., schools or colleges), the relatively few susceptible persons may be sufficient to sustain transmission and outbreaks may occur. In order to reduce this pool of susceptible persons resulting from vaccine failure, the Immunization Practices Advisory Committee (ACIP) has recommended a second dose of vaccine for groups of persons at high risk for measles, including new entrants to schools and colleges and other institutions for post-high school education (7). If fully implemented, this strategy should eventually eliminate measles outbreaks in these settings. In the meantime, aggressive outbreak control in school-based outbreaks with revaccination of persons at risk will continue to be necessary (7).

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### **Perinatal Mortality and Congenital Malformations in Infants Born to Women with Insulin-Dependent Diabetes Mellitus — United States, Canada, and Europe, 1940-1988**

Women with insulin-dependent diabetes mellitus account for approximately five per 1000 pregnancies. Because there is no national surveillance of pregnancies among women with insulin-dependent diabetes, national trends in the rates of perinatal mortality (PNM) and congenital malformations associated with maternal diabetes cannot be monitored.

This report uses data from 225 U.S., Canadian, and European hospital-based reports\* published from 1940 through 1988 of pregnancies of women with insulin-dependent diabetes to evaluate the relationship of congenital malformations and PNM in such pregnancies. These data were compared with published hospital-based data for all women for the same years. The only reports included were those that had identified women with insulin-dependent diabetes and had calculated the PNM rate and/or the proportion of PNM from congenital malformations for women with insulin-dependent diabetes.

\*References are available on request from CDC's Division of Birth Defects and Developmental Disabilities, Center for Environmental Health and Injury Control; telephone (404) 639-4706.

*Perinatal Mortality — Continued*

From 1940 through 1988, in the United States and Canada and in many European countries, the PNM rate for infants of women with insulin-dependent diabetes decreased from 250–300 per 1000 births to 30–50 per 1000. The rates of decline were similar in the United States and Canada and in Europe (Figure 1). For all infants, however, the PNM rate did not decrease as much. In the United States, for example, the overall PNM rate decreased from about 60 per 1000 in the 1940s to 15 per 1000 in the 1980s.

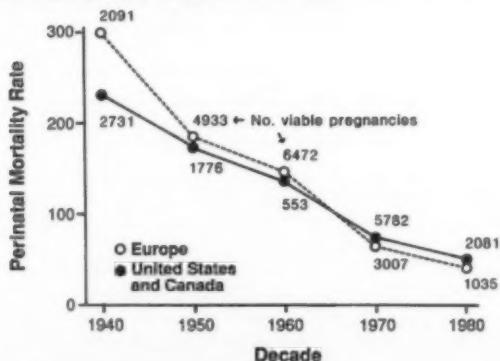
Progress in the prevention of all causes of PNM has not proceeded evenly; serious congenital malformations have continued to be proportionately more frequent among perinatal deaths among infants of women in both the diabetes and overall groups (Figure 2).

In the United States and Canada and in Europe, the proportion of perinatal deaths associated with congenital malformations in the 1950s and 1960s (13%–17%) was almost identical for infants of women with insulin-dependent diabetes and for infants of all women. However, although the mortality rate for infants of women with diabetes declined faster than that for all infants, the percentage of congenital malformation-associated deaths in the diabetes group surpassed the percentage of such deaths in the overall population. For infants of women with diabetes, the frequency of such deaths increased to >30% in the 1970s and to 45%–50% in the 1980s; in contrast, for infants overall, it remained <30% in the 1970s and 1980s. Despite the demographic distinctions between the two regions, incidence rate trends were similar in the United States and Canada and in Europe (Figure 2).

Reported by: H Kalter, PhD, Children's Hospital Research Foundation, Dept of Pediatrics, Univ of Cincinnati College of Medicine, Cincinnati, Ohio. Div of Birth Defects and Developmental Disabilities, Center for Environmental Health and Injury Control, CDC.

**Editorial Note:** Women with insulin-dependent diabetes are at increased risk for a variety of adverse pregnancy outcomes such as stillbirths, obstetric complications,

**FIGURE 1. Decrease in rates of perinatal mortality\* among infants born to women with insulin-dependent diabetes, determined from hospital-based reports, by decade — United States, Canada, and Europe†, 1940–1988**



\*Late fetal and early neonatal deaths per 1000 births.

†Austria, Belgium, Denmark, Federal Republic of Germany, Finland, France, German Democratic Republic, Italy, Netherlands, Norway, Sweden, Switzerland, and the United Kingdom.

## Perinatal Mortality — Continued

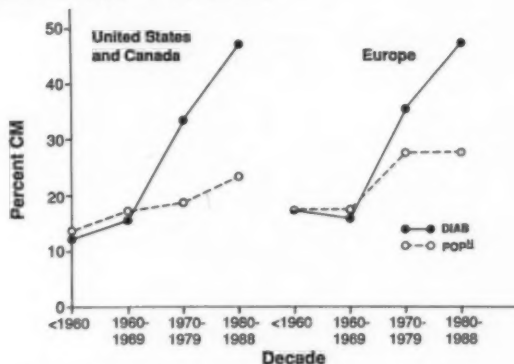
and congenital malformations. General improvements in prenatal care and in obstetric management of women with diabetes have led to a substantial decline in PNM rates among their infants. With these improvements, however, congenital malformations have emerged as the most common cause of PNM for infants of women with insulin-dependent diabetes, accounting for approximately 50% of all perinatal deaths.

The excess risk for congenital malformations among infants of mothers with diabetes has been estimated in population-based studies, such as a recent case-control study conducted by CDC (1). Although the genesis of congenital malformations among infants of women with insulin-dependent diabetes is not well understood, other factors may be involved in addition to glycemic control (2). Further research on the mechanisms of teratogenesis associated with diabetes should improve pregnancy outcomes for women with this form of diabetes.

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**FIGURE 2. Increase from 1960 through 1980 in the percentage of congenital malformations (CM) associated with perinatal mortality (PNM) among infants of women with insulin-dependent diabetes (DIAB) and all infants (POP<sup>1</sup>) — United States, Canada, and Europe\* — 1940-1988**



\*Austria, Belgium, Denmark, Federal Republic of Germany, Finland, France, German Democratic Republic, Italy, Netherlands, Norway, Sweden, Switzerland, and the United Kingdom.

## Cholera — Worldwide, 1989

As of April 30, 1990, 48,403 cholera cases worldwide were reported to the World Health Organization (WHO) (Table 1), compared with 44,083 in 1988. The number of countries reporting the disease increased from 30 in 1988 to 35 in 1989. Two countries—São Tomé and Príncipe and Yugoslavia—reported indigenous cases of

*Cholera — Continued*

cholera for the first time during the present pandemic. As in previous years, there was strong evidence that cholera occurred in several countries that failed to report the disease.

**Africa**

In Africa, 35,606 cases were reported by 16 countries in 1989, compared with 23,186 cases reported by 12 countries in 1988. A particularly large outbreak, with more severe cases than in previous years, began in Malawi in October 1989; Ogawa was the predominant serotype of *Vibrio cholerae* 01, whereas the Inaba serotype had been responsible for past epidemics. Cholera was reported for the first time in 1989 by São Tomé and Príncipe, where 3953 cases occurred. The epidemic in Angola continued despite seasonal fluctuations, and the total number of cases increased during 1988. Although substantial reductions in cases were reported by Rwanda and the United Republic of Tanzania, cholera appeared again in Mozambique, Niger, and Zambia, which had not reported cases in 1988.

**Asia**

In Asia, a total of 12,785 cases were reported by 12 countries, compared with 20,872 cases in 11 countries in 1988. A large outbreak was reported by Peoples Republic of China during May–September 1989 in Xinjiang Autonomous Region, where an epidemic had occurred in the same season in 1988; the source for both years was a contaminated water supply. In Japan, most cases occurred as foodborne outbreaks that were rapidly controlled and did not result in secondary spread (1).

**TABLE 1. Reported cholera cases — worldwide, 1989**

Country	No. cases	Country	No. cases
<b>Africa</b>		<b>Asia</b>	
Algeria	48*	Peoples Republic of China	6,158
Angola	17,601	Hong Kong	29 ( 23 <sup>†</sup> )
Burundi	94*	India	5,026
Cameroon	4	Indonesia	67
Kenya	918*	Japan	99 ( 37 <sup>†</sup> )
Liberia	28	Kuwait	133 <sup>†</sup>
Malawi	8,351	Macao	3 <sup>†</sup>
Mauritania	700	Malaysia	350
Mozambique	371	Myanmar	597
Niger	166	Nepal	141
Nigeria	1,078	Singapore	39
Rwanda	1	Viet Nam	143
São Tomé and Príncipe	3,953	<b>Total</b>	<b>12,785 (196<sup>†</sup>)</b>
United Republic of Tanzania	2,150		
Zaire	99	<b>Europe</b>	
Zambia	44	Federal Republic of Germany	1 <sup>†</sup>
<b>Total</b>	<b>35,606*</b>	France	1 <sup>†</sup>
		Norway	1 <sup>†</sup>
<b>Americas</b>		Spain	3 ( 2 <sup>†</sup> )
Canada	1 <sup>†</sup>	United Kingdom	1 <sup>†</sup>
<b>Total</b>	<b>1<sup>†</sup></b>	Yugoslavia	4 ( 2 <sup>†</sup> )
		<b>Total</b>	<b>11 ( 8<sup>†</sup>)</b>
		<b>WORLD TOTAL</b>	<b>48,403 (205<sup>†</sup>)</b>

\*Incomplete numbers.

<sup>†</sup>Imported cases.

*Cholera - Continued*

Cases also appeared in Kuwait, Macao, Myanmar, and Nepal, which did not report cases in 1988.

**Europe**

In Europe, 11 cases, mostly imported, were reported by six countries in 1989, compared with 14 cases reported by four countries in 1988. The two indigenous cases reported by Yugoslavia were associated with a waterborne epidemic during August-September caused primarily by *Shigella sonnei*; further spread of cholera was prevented by strict control measures.

*Adapted from the Weekly Epidemiological Record 1990;65:141-2. Enteric Diseases Br, Div of Bacterial Diseases, Center for Infectious Diseases, CDC.*

**Editorial Note:** Sub-Saharan Africa reported nearly three quarters of the world's cholera cases in 1989. Increasing experience in treating cholera and widespread use of oral rehydration have helped reduce the case-fatality rate. However, prevention of the disease has been difficult. Recent investigations of cholera in Africa (1,2) have shown that the modes and vehicles of transmission vary from place to place and have identified simple and practical ways to prevent transmission. The findings emphasize the need for epidemiologic investigation of epidemic and endemic cholera to determine how the disease is transmitted in each locale and to design practical area-specific control measures.

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**Notices to Readers****Occupational Safety and Health Guidelines for Chemical Hazards**

CDC's National Institute for Occupational Safety and Health (NIOSH) has issued two supplements to the *NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards* (1). Both supplements are entitled *Occupational Safety and Health Guidelines for Chemical Hazards* (2,3)\*; they contain 65 additional guidelines useful to workers, employers, and occupational safety and health professionals. Each guideline includes the chemical name; synonyms; chemical and physical properties; exposure limits; signs and symptoms of exposure; and recommendations for medical monitoring, respiratory and personal protective equipment, and control procedures. The recommendations reflect good industrial hygiene and medical monitoring practices that will enhance worker-protection programs if they are implemented by employers. The guidelines will be updated as new information becomes available. These

\*Single copies of the supplements are available without charge from the Publications Dissemination Section, DSDTT, National Institute for Occupational Safety and Health, CDC, 4676 Columbia Parkway, Cincinnati, Ohio 45226; telephone (513) 533-8287. Copies of the original three-volume set of *NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards* (NTIS no. PB-81-167-710/A20) can be obtained from the National Technical Information Service, Port Royal Road, Springfield, VA 22161.

*Guidelines - Continued*

recommendations should be understood as general approaches to addressing chemical hazards. They do not provide specific guidelines for achieving compliance with occupational safety and health regulations.

The 1981 publication is a three-volume set that was originally distributed in ringed binders. Each guideline from the new supplements can be inserted at the appropriate place in that original set.

*Reported by:* Div of Standards Development and Technology Transfer, National Institute for Occupational Safety and Health, CDC.

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